A New Subspecies of Epargyreus clarus from Arizona with Distributional Notes (Lepidoptera: Hesperiidae)

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While arranging the series of *Epargyreus clarus* Cramer in the collection of the Carnegie Museum, it was noticed that specimens from Arizona differed consistently from the material of other parts of the country. Upon investigation, certain other points, as well, were noted. The results of this study are presented below.

1. Type Localities of *Epargyreus clarus* Cr. and *tityrus* Fab.

Cramer, in his original description of *Papilio clarus* (1775, Pap. Exot. 1: 66, pl. 41, figs. E, F), gives Surinam as the type locality. All references to the South American occurrence of *clarus,* except a very few, seem to be traceable to the original citation by Cramer. In the large collection of the Carnegie Museum, I have not been able to find a single specimen of *clarus* from either Central or South America. A few records of the occurrence of *clarus* in Latin America, however, can be found in the literature. For example:

Evans (1952, Cat. Amer. Hesp. Brit. Mus. 2: 45–46) records three males and one female from Mexico (North Sonora), one male from Honduras, one male from Colombia, one male from Surinam, and one male from Brazil. Evans, himself, indicated that the specimens from Colombia, Surinam, and Brazil are of doubtful authenticity. This would suggest that Honduras was probably the extreme southern limit of *clarus,* and even this might be doubtful.

Hoffmann (1941, Ann. Inst. Biol. 12: 245) records *clarus* from Baja California and again from North Sonora. Taking into account the fact that both Evans and Hoffmann record *clarus* from North Sonora, it is quite possible that the species is well established there, and for all practical purposes Sonora might be considered the southern limit of *clarus.* The Baja California record is not of truly great significance, distribu-

tionally speaking, since it is a peninsula, but the population might be most interesting to examine.

Godman and Salvin (1898, Biol. Cent. Am. 2: 300) state that, so far as known to them, *clarus* does not occur in Central America.

Mr. E. L. Bell (*in litt.*) doubts that it occurs in South America at all.

From the above, there is obviously very strong reason to believe that the Surinam citation of Cramer is in error. Since it is highly desirable that a definite type locality exist for every specific name, I hereby designate as type locality of *Papilio clarus* Cramer: Dayton (Rockingham Co.), Virginia, based on a series of six males and two females in the Carnegie Museum (coll. by H. C. Will, June–August, 1931, C. M. Acc. No. 9140), on the assumption that Virginia, if not the most likely source of Cramer's material, is at least a very logical one.

Fabricius, in his description of *Papilio tityrus* (1775, Syst. Ent., p. 532), cites only America as type locality. This makes it possible to designate the same locality (Dayton, Va.) for *tityrus,* which is hereby done, and for the same reason.

2. Description of the New Subspecies

Epargyreus clarus huachuca subsp. nov.

On the upper surface *huachuca* differs primarily from *clarus* in that the golden spot in cell Cu_1 of the fore-wing is completely separated from the large spot in cell M_3. The length of the former spot along Cu_1 is much less in *huachuca,* and in one specimen (Arizona, Lindsey Coll'n) this spot is almost gone (0.4 mm.). In all male specimens of typical *clarus* examined, the latter spot is at least three times longer than the small spot in cell Cu_1 and always touches or overlaps the large spot.

On the underside, *huachuca* has the grey-violet areas along the outer margin enlarged and of a lighter grey color; the large silver spot on the hind wing is compressed laterally in *huachuca,* and the whitish lines which usually run along the outer margin

of this spot are often absent. The fringes, both on the upper and under surfaces, are decidedly darker in *huachuca* than in *clarus*.

Genitalically *huachuca* does not appear to differ consistently from *clarus* except that the lower region of the vinculum is slightly constricted as in *exadeus*.

Holotype, male, Huachuca Mts., Cochise Co., ARIZONA, June, 1940 (A. C. Twomey). *Allotype,* female, same data as holotype. Seven male and three female *paratypes,* same data as holotype; one male *paratype,* "Arizona" (Holland Coll'n); two male and two female *paratypes,* Garces, Arizona, July (Biedermann); two male *paratypes,* Williams Creek, Arizona, 26 May 1932 (Sweadner Coll'n); one female *paratype,* White Mts., Arizona, 7 July 1932 (Sweadner Coll'n); two female *paratypes,* Pinal Mts., Arizona, 29 July 1927 (E. Graham); two female *paratypes,* Chiricahua Mts., Arizona, 1–7 July 1940 (A. C. Twomey); one male, one female *paratypes,* "Arizona" (Edwards Coll'n); one male *paratype,* "Arizona" (Lindsey Coll'n).

All types C. M. Ent. type series no. 237. One pair of paratypes in my collection; all others in the Carnegie Museum.

A single male from New Mexico (Holland Coll'n, C.M., no further data) has been examined. It appears to be *huachuca,* but is so worn that identification is uncertain.

A very few specimens of *clarus* have been seen from "Washington Territory," Oregon, California, Colorado, Wyoming, and northern Utah. None of these are referable to *huachuca,* and I suspect, accordingly, that the new subspecies is probably confined to Arizona and the immediately adjacent region.

Size. Length of gold spot in cell Cu_1, fore-wing, along Cu_1 of holotype and eight male paratypes (mm.): 0.8, 0.9, 1.0 (2), 1.1, 1.2, 1.3, 1.4, 1.5, mean 1.13. The same for the allotype and eight female paratypes: 1.5 (2), 1.6, 1.7 (2), 1.8, 1.9, 2.0, 2.1, mean 1.75.

Amount of separation between spot in cell M_3 and spot in cell Cu_1, fore-wing, measured along Cu_1, of holotype and eight

male paratypes (mm.): 0.2, 0.3, 0.5, 0.8 (2), 1.3, 1.4, 1.9, 2.0, mean 1.02. The same for the allotype and eight female paratypes: 0.1, 0.2 (2), 0.4, 0.5 (2), 0.6, 0.7, –0.2,[1] mean 0.33.

Last, but not least, I wish to give thanks to Mr. Harry K. Clench of the Carnegie Museum, who was kind enough to let me study the museum series, and who was a loyal stand-by in times of despair. I also wish to thank Mr. E. L. Bell of Flushing, New York, and Dr. A. W. Lindsey of Denison University, both of whom furnished material on the southern limit of *clarus,* along with several other helpful suggestions.

Observations on Two Species of Phidippus (Jumping Spiders)

By Robert Snetsinger, Illinois Natural History Survey, Urbana

Direct field observations were made on species of Salticidae in study areas in central Illinois from 1951 to 1953. These areas were readily accessible and observations were made, depending to a considerable extent on the activities of the spiders, throughout the period. At mating and brooding time it was possible to keep individual records on series of individuals of some species. Observations were made and notes taken, much as life-history studies are made by bird students.

Phidippus audax (Hentz) and *P. rimator* (Walckenaer) were two of the most abundant species in the field edges, prairie remnants, prairie groves, and waste areas under observation. Both species appear to have similar life-histories, food requirements, nesting sites, and other niche requirements. This would apparently mean a direct clash for the basic niche requirements, except that differences in the seasonal timing of their activities (fig. 1) permit these two species to occupy the same area in apparent harmony. Accounts of life-histories of *P. audax* and *P. rimator* are combined here because of their similarities.

[1] In this specimen the spots *overlap* to the extent shown.